

ART. XI.—*Descriptive Notes on Tertiary Mollusca from
Fyansford and other Australian Localities, Part I.*

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(With Plates X., XI.)

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The following notes deal in the main with species contained in the Tertiary molluscan fauna of the Orphanage Hill beds at Fyansford, near Geelong, now under revision by the present authors. A few species not occurring in that fauna, but of interest as allied forms, are also included.

Class PELECYPODA.

Family NUCULIDAE.

Genus *Nucula* Lamarck.

NUCULA OBLIQUA Lamarck.

Nucula obliqua Lamarck, 1819¹, p. 59. Hedley, 1902, p. 292.

Chapman and Gabriel, 1914, p. 301.

Nucula tumida T. Woods (*non* Phillips *nec* Hinds), 1877, p. 111.

Tate, 1886, p. 127, pl. vi., figs. 6a,b.

Nucula tenisoni Pritchard (*nom. mut.*), 1896, p. 128.

Observations.—In studying a long series of fossil shells from the various Tertiary horizons, we have reconsidered the question of their identity with the Recent *N. obliqua*, as affirmed by Pritchard, Hedley, and other authors. Upon comparison with Recent shells dredged by Mr. C. J. Gabriel in 8 fathoms off Point Cook, Port Phillip Bay, we observe that Lower Tertiary (Balcombian and Janjukian) shells tend to be somewhat produced anteriorly, and in some cases to be less inflated than is usual in the Recent shells. Upper Tertiary (Kalimnan and Werrikooian) examples commonly attain a rather larger size and are notably heavier in build.

After much consideration as to the relative stability of variations in the fossil forms, we cannot but consider that they all belong to one species, for the reason that although the general tendency in the fossils is towards a more elongate valve, a long series always contains some examples which are inseparable from the generally shorter and more convex Recent type, and conversely among living shells individual valves are more elongate than the average.

1.—Full references are cited in the list at the end of this paper.

NUCULA ATKINSONI (Johnston).

Portlandia Atkinsoni Johnston, 1880, p. 39.

Nucula Atkinsoni, Johnston: Tate, 1886, pp. 127, 128, pl. iv., figs. 3a-c. Johnston, 1888, pl. xxxi., figs. 16, 16a.

Observations.—In this species a great range of surface ornament is apparent, when a fair series is examined. The ordinary reticulated ornament, as a rule best developed towards the ventral region, often varies in the direction of suppression of the radial striae; the shell having in the extreme forms, a corrugated rather than a reticose ornament. A feature hitherto unnoted is the presence in most cases of a discrepant ornament, in which a divarication of the concentric riblets is developed on the anterior side of the shell, but not, however, so well developed as in the genus *Acila*, H. and A. Adams.

The divarication varies in strength on the different geological horizons. Thus at Balcombe Bay and Muddy Creek (Balcombian) it is represented only by a slight corrugation on the extreme anterior border, whilst the valve-surfaces are nearly smooth. Most of the Janjukian variations are in the direction of a strongly corrugated shell, usually with pronounced divarication. Those from Beaumaris (Kalinman) are smoother shells like the oldest representatives, and without divarication, but with a more trigonal shape.

This divaricate ornament is more constant in the New Zealand Tertiary species *N. sagittata*, Suter (1917, p. 65, pl. vii., fig. 6), a close relative of the Australian species. Compared with examples of Suter's species from Ardgowan, near Oamaru, our shells differ in their uniformly smaller dimensions, greater tumidity, less conspicuous resillifer and finer denticulation of the inner ventral margin, while in ornament the Australian species, though variable, always shows much deeper concentric ribbing but weaker radial striations.

NUCULA BREVITERGUM, sp. nov.

(Plate X., Figs. 1a,b.)

Description.—Holotype, left valve. Shell moderately thin, smooth, somewhat depressed, very inequilateral, subovate in outline. Umbo subacuminate; posterior margin short, straight, nearly at right angles to dorsal margin and meeting ventral border in a wide curve; anterior extremity sharply curved. Shell surface marked with fine concentric lines of growth of varying strength, more irregular in the ephelic stage. Interior of shell smooth, ventral margin flattened, without denticulations. Cardinal line having about 18 slightly uncinuate teeth anteriorly and 6 oblique teeth posteriorly, separated by an acutely angular elongate resillifer. Lunule long, linear; escutcheon semilunate, bounded by a slight angulation with shell surface.

Length 8.75 mm.; height 6.5 mm.; thickness of valve 2 mm.

Observations.—The shortness of the posterior margin and the lengthened valve, with its generally depressed surface, separate this species from certain variants of fossil forms of *N. obliqua*. We have compared the present form with the Recent *N. superba*, Hedley (1902, p. 292; 1912, p. 131, pl. xl., figs. 1, 2), and although at first sight it appears to be comparable in outline, the latter species has a more strongly arcuate dorsal margin, whilst the shell surface is strongly concentrically ridged on the posterior region; moreover the inner margin of *N. superba* is finely denticulate, whereas in *N. brevitergum* it is smooth. The resilifer is deeper and wider in the recent than in the fossil species.

Occurrence.—Balcombian (Oligocene). Lower beds at Muddy Creek, Victoria (holotype in Dennant Coll., Nat. Museum).

Kalimnan (Lower Pliocene).—Jimmy's Point, Gippsland Lakes, Victoria. A solitary specimen occurs with *N. obliqua* from this locality in the Dennant Coll., but we feel some doubt as to its authenticity.

Family NUCULANIDAE.

Genus *Nuculana* Link.

NUCULANA CHAPMANI Finlay.

Leda apiculata Tate (*non* J. de C. Sowerby), 1886, p. 132, pl. ix., figs. 4a,b.

Nuculana chapmani Finlay (*nom. mut.*), 1924, p. 107.

Observations.—We are unable to include in the synonymy of the above species the Balcombian *N. acuticauda* (Pritchard), (1901, pp. 27, 28, pl. iii., figs. 4, 4a), as suggested by Dennant and Kitson (1903, p. 122, footnote). The latter species appears to be slightly variable in its degree of rostration, the type representing an extreme form (which can, however, be matched) in which the shell is posteriorly "drawn out into a very acutely pointed end" (Pritchard, *loc. cit.*). Of the other differential characters cited by Pritchard, the most ready means of distinction lies in the absence of the regular raised concentric ornament typical of *N. chapmani*.¹

1.—While this paper was passing through the press we have seen a statement by Mr. H. J. Finlay (*Trans. N.Z. Inst.*, lvii., p. 523, 1927) that "*N. chapmani* does not occur at Balcombe Bay (nor probably in the Balcombian at all), being represented by *N. acuticauda* Pritch., and a variety of it." We have examined examples in the Dennant Coll. (Nat. Mus.) of *N. chapmani* Finlay [= *Leda apiculata* Tate] from the lower beds at Aldinga Bay, the type locality subsequently selected by Finlay, which agree well with Tate's description and figure. The two Mornington examples labelled as *N. apiculata* in the Dennant Coll. we identify as *N. acuticauda* (Pritchard), but of a series of 177 *Nuculanae* collected at Balcombe Bay by Mr. F. A. Cudmore, the great majority agree closely with the Aldingan topotypes of *chapmani*, the 28 exceptions being referable to *acuticauda*. The horizon of Finlay's type locality (Lower Aldingan) is, by the way, generally correlated with the Janjukian, and is certainly not Eocene.

Genus *Sarepta* A. Adams.*SAREPTA OBOLELLA* (Tate).

(Plate X., Figs. 2-7).

Leda obolella Tate, 1886, p. 130, pl. v., figs. 3a,b.*Sarepta? tellinaeformis* Hedley, 1901, pp. 26, 27, fig. 8.*Sarepta obolella*, Tate sp.: Hedley, 1902, p. 295.*Ovaleda tellinaeformis* Hedley: Iredale, 1925, p. 250.

Observations.—Iredale (1925, p. 250) has proposed the new generic name *Ovaleda*, citing as genotype Hedley's *Sarepta? tellinaeformis*, which the latter author finally regarded as conspecific with the fossil shell. Iredale states that "the recent forms are generally higher, deeper, with coarser sculpture, the beaks a little more angulate, and the hinge teeth-fewer." At the same time he admits the relationship to be "very close and of disputable value," and proposes to indicate this by the use for the recent shell of the trinomial *Ovaleda [obolella] tellinaeformis* Hedley.

We have had on loan from the Australian Museum four virtual topotypes of Hedley's species, one of which we figure (Pl. X., Fig. 5), from 33-56 fathoms, Botany Heads, as well as a series of eight, illustrating growth stages, from off Cape Three Points, both in New South Wales. Fossil material in the National Museum used for comparison included a fine series of topotypes of Tate's species from the lower beds at Muddy Creek (Dennant Coll.), as well as many examples from Fyansford (G.S.V. Coll.).

At first sight the recent and the fossil specimens appear to show some differences that might be of specific value, such as in outline and inflation, but these features can be exactly matched, as illustrated on Pl. X., Figs. 6, 7, in a long series of the fossils, and these again pass insensibly into the commoner, more elongate form, which is illustrated by Figs. 2-4. We find the sculpture variable in both, while the hinge teeth appear to us to be equally numerous, but more salient in the fossil shells, a feature evidently due to loss of area resultant on dissolution of the inner conchiolitic margin. We are thus unable to find any specific break, nor can we see reason for the removal of the species from *Sarepta*.

SAREPTA PLANIUSCULA (Tate).

(Plate X., Figs. 8-12.)

Leda planiuscula Tate, 1886, p. 131, pl. v., fig. 2.

Note on Tate's Syntypes.—The tablet bears five specimens from the Adelaide bore, of which all but the two smallest are imperfect. Tate has labelled as types the whole series, and from the dimensions given has evidently figured the largest example, which we here designate as lectotype (Pl. X., Fig. 8). This, the uppermost shell on the tablet, is $5\frac{1}{4}$ mm. long, $4\frac{1}{4}$ mm. high, and 1 mm. in thickness, which agrees fairly well with Tate's $5 \times 4\frac{1}{2}$ mm. and his figure, drawn by Chidley, measuring 5×4 mm.

Observations.—Tate (*loc. cit.*) states: "Shell minute, similar to *L. obolella*: comparing equal-sized specimens of each, *L. planiuscula* is more deepened and the outline approaches more to the circular."

In addition, we note that *S. planiuscula* possesses a less prominent umbo and, if the lectotype be an adult shell, is a much smaller species than *S. obolella*. Nevertheless, owing to the paucity and unsatisfactory nature of the available material, we are unable to feel entirely satisfied as to its specific validity.

Family PECTINIDAE.

Genus *Propeamusium* Gregorio.

PROPEAMUSIUM ATKINSONI (Johnston).

(Plate X., Figs. 13-19.)

Amusium Atkinsoni Johnston, 1880, p. 41. Idem, 1888, pl. xxxi., figs. 15, 15a.

Pecten Zitteli, Hutton: Tate, 1886, pp. 115, 116, pl. vii., figs. 3a-c (non Hutton).

Amusium atkinsoni Johnston: Marwick, 1924, p. 318.

Observations.—Marwick (*loc. supra cit.*) has recently discussed the supposed identity of the Australian shell with the New Zealand *Pecten zitteli* Hutton, as affirmed by Tate. We accept Marwick's conclusion that "specific identity is not established, and until better New Zealand material is available the Australian species should be called *Amusium atkinsoni* Johnston." We further agree with Marwick in referring our shell to *Propeamusium*, but consider Gregorio's name worthy of generic rank.

Johnston in his original description of a Table Cape shell appears to have regarded both valves as having a similar concentric ornament. Tate (*loc. cit.*) has commented upon this and given a full description of the discrepant ornament of the right valve, based apparently on Balcombian examples from Muddy Creek, from which locality we figure further specimens. The type of *Amusium atkinsoni* should be contained in the Johnston collection, now in the Tasmanian Museum, Hobart, but has not yet come to light.

The only topotype available to us is a right valve (Pl. X., Fig. 13) collected by Mr. F. A. Cudmore at Table Cape, Tasmania. This shell, though considerably obscured by matrix, shows the radial ribs and concentric ornament, which constitute a fenestrate pattern, to be of equal strength. The dorso-ventral diameter is relatively greater than in the Muddy Creek examples, which approach more to the orbicular in outline. The well-preserved right valves from this locality show in addition to a primary series of radial costae, continuous over the whole valve excepting on the embryo, a secondary series, much shorter and extending over the ventral region to about one-third to one-half of the valve.

Family CARDITIDAE.

Genus *Venericardia* Lamarck.*VENERICARDIA GRACILICOSTATA* (T. Woods).

(Plate XI., Figs. 20, 21.)

Cardita gracilicostata T. Woods, 1877, p. 112. Tate, 1886, p. 152, pl. ii., figs. 6, 8.

Note on Tate's Plesiotypes.—The tablet bears four valves from Table Cape (R. M. Johnston coll.), of which the two on the left are marked as figured. The upper of these agrees in dimensions with Tate's description and figure (*loc. cit.*, pl. ii., fig. 6), but the other measures $21\frac{1}{4}$ mm. long by $18\frac{1}{4}$ mm. high, whereas the illustration (Fig. 8) has been enlarged to 29×25 mm. Both are right valves, Chidley's drawings having been reversed in lithographing, and are here refigured.

Observations.—The number of ribs is given by Woods as 30 to 34; by Tate as about 30; and we find 31 in each of Tate's figured specimens and 32 in the other two on his tablet. The five largest topotypes in the Demant Coll. (National Museum), exhibit 31, 35, 31, 31, 34, giving a mean for nine examples of 32 ribs.

V. gracilicostata attains much larger dimensions than *V. scabrosa*, and is matched in size only by a *Venericardia* common in the Janjukian of Spring Creek, hitherto identified as *V. polynema* on Tate's authority, but herein described as a new species, *V. janjukiensis*.

V. latissima is closely allied in number of ribs and in ornament, but is wider posteriorly and suborbicular rather than suboval in outline. The young forms of the above four species are almost impossible to separate.

VENERICARDIA LATISSIMA (Tate).

(Plate XI., Figs. 22, 23.)

Cardita latissima, Tate, 1886, p. 153. pl. ii. (not pl. x., as in text), fig. 5.

Note on Tate's Metatypes.—Of the eleven examples on the tablet, from the Adelaide-bore, none is marked as figured, but the left valve in the top left-hand corner agrees in dimensions with Tate's description and the accompanying reversed figure. It is here refigured and regarded as holotype. This specimen (the largest) is $31\frac{1}{2}$ mm. long and 29 mm. high, and bears 34 ribs, of which the three anterior are very small. Another, of nearly equal dimensions, has 30 ribs, and the next four smaller examples 32, 28, 28 and 28 respectively, giving an average of 30 ribs, the number given in Tate's description. The first of these smaller shells, measuring 21 mm. long and 19 mm. high, and bearing 32 ribs, we also figure. The juvenile series bear 27, 23, 21, and 14 ribs in a very minute shell.

Observations.—Tate compares this shell in ornament with juveniles of *V. gracilicostata*, but notes the difference in shape. This ornament of erect scales is, however, also characteristic of the other members of this group, *scabrosa*, *polynema* and *janjukien-sis*, as well as of other species. The outline to some extent recalls that of *V. polynema* (regarded in this paper as a variety of *V. scabrosa*), but this is more numerously ribbed and narrower anteriorly, as well as being a smaller shell in the adult stage.

VENERICARDIA SCABROSA (Tate).

(Plate XI., Figs. 24-26.)

Cardita scabrosa Tate, 1886, p. 152, pl. ii., fig. 4. Pritchard, 1896, pp. 132, 133.

Note on Tate's Metatypes.—Tate's original tablet bears fifteen examples, of which the top row of three is marked as from the Murray Cliffs, the locality given for his figure, but none is indicated as the type or as having been figured. The central specimen, here illustrated, would agree quite well with Tate's figure by Chidley, were it not that other illustrations on the same plate are known to have been reversed. It is, moreover, of smaller dimensions than those given by Tate ($18\frac{1}{2} \times 15$, as against 21×16 mm.). The tablet, however, is the only one of this species in the type collection of the Tate Museum, University of Adelaide, and we therefore designate the shell now figured (Pl. XI., Fig. 24), as lectotype of the species, while indicating the discrepancies above noted.

Counting the minute anterior ribs, we find in Tate's Murray River shells 32, 32 and 29, averaging 31 ribs; in his Muddy Creek series 31, 34, 29, 28 and 33, also averaging 31. Of these latter we have excluded the middle shell in the third row, here figured (Pl. XI., Fig. 29), as being better referable to *polynema*, with which it agrees in outline. It bears 34 ribs. Another of somewhat similar outline is the left-hand shell in the second row (Pl. XI., Fig. 25), having 31 ribs, and retained by us in *scabrosa* (*s.str.*). We are inclined to refer the juvenile Cheltenham [=Beaumaris] shell with 21 ribs, in the bottom row of the tablet, to *V. spinulosa* (Tate) rather than to *V. scabrosa*.

Tate's original diagnosis of the species well fits the lectotype, from which, indeed, it may have been drawn, and there is therefore no necessity to give any further description if the smaller dimensions (length $18\frac{1}{2}$ mm., height 15 mm., and thickness of valve $5\frac{1}{2}$ mm.) be borne in mind, as well as the fact that the lectotype is a right valve.

Observations.—The distinctive characters of the lectotype of *V. scabrosa* seem to be its long quadrate outline, its steeply sloping posterior margin, not very salient umbones, and squarely keeled costae, 32 in number. We indicate hereunder our belief that both in outline and in costation this species runs into *polynema*, which we reduce to varietal rank, and under which heading we discuss their differential characters.

VENERICARDIA SCABROSA, var. POLYNEMA Tate.

(Plate XI., Figs. 27-29).

Cardita polynema Tate, 1886, p. 153, pl. ii., fig. 7.

Note on Tate's Metatypes.—The tablet labelled *Cardita polynema* from the type collection in the Tate Museum, University of Adelaide, bears ten examples, all from Schnapper Point [=Balcombe Bay], the only locality cited in Tate's original description. While none is marked as figured, the left valve in the top left hand corner is the only one agreeing with the dimensions (18 x 15 mm.) and number of ribs (37) given by Tate, and is identified by us as the holotype (Pl. XI., Fig. 27). Chidley's figure is reversed and also enlarged, and does not satisfactorily represent the outline.

Of the remainder, shells comparable with the holotype bear 35, 32, 34 and 36 ribs, the last of which we also figure (Pl. XI., Fig. 28). Smaller examples have 33(?), 32, 32, and 30, and a juvenile 15 ribs respectively.

Observations.—Tate appears to have selected an extreme form for his diagnosis of *V. polynema*, and in a long series we have not seen another example so numerous costated as the holotype. We suggest that the definition of *V. polynema* be extended to include shells of 34 to 37 ribs having also a subovate outline, and that the 32-ribbed shell of Tate's series be referred to *V. scabrosa*, to whose more subquadrate outline it approximates.

The close relationship of the above species is emphasized by our belief that each of Tate's type tablets contains an example of the opposite species. These two names appear to us to have been applied to extreme members of a very variable form, in which the costation ranges between extreme limits of 28 to 37 ribs, and the outline from subquadrate to suboval, and since *scabrosa* has page priority we accord to *polynema* only varietal rank. If the shape be taken as a criterion, then *polynema* must be extended to include shells (e.g., Pl. XI., Fig. 25), with only 31 ribs, which can hardly be reconciled with Tate's diagnosis and name. It appears preferable to utilize the costation, referring shells with less than 34 ribs to *scabrosa*, *s.str.*, and to var. *polynema*, the more numerous ribbed forms. These latter (Figs. 27-29) are typically suboval in outline, narrowed anteriorly, while the less numerously costate shells are usually subquadrate (Fig. 24), but occasionally approximate to the suboval (Fig. 25).

VENERICARDIA JANJUKIENSIS, sp. nov.

(Plate XI., Figs. 30a,b, 31.)

Cardita polynema auctorum, non Tate, 1886.

Description of Holotype.—Right valve, roundly subquadrate in outline, anterior beneath the beak not so produced as in *V. gracili-*

costata, so that the umbo is placed more anteriorly than in that species; lunule ovate, valve deep, giving a more tumid profile than in *V. gracilicostata*, in which the ventral region is more depressed. Costae 36, rather sharply V-shaped, with erect scales, developing into spines on the last four or five posterior ribs; interspaces wider than ribs and marked by distinct lines of growth, which are stronger when confluent with the scales of the ribs. Interior margin strongly denticulate, crenulations sharply pointed.

Observations.—This, the commonest species of the genus in the Spring Creek beds, has always been listed as *polynema*, and we figure (Pl. XI., Fig. 31), an example so identified in the Tate collection. It resembles Balcombian topotypes of *polynema* only in the number of ribs, but is a very much larger shell of heavier build, with the umbo placed less anteriorly than in typical *polynema*. The affinities of the Spring Creek shells, however, lie rather with *V. gracilicostata*, which is of similar heavy build and large dimensions. The former, as stated by Tate, are less produced anteriorly and usually more numerous ribbed. The holotype of *V. janjukiensis* bears 36 costae as against 31 in Tate's plesiotype of *V. gracilicostata*, while series of each average $34\frac{1}{2}$ and 32 respectively, with limits of 34-37 and 31-35 ribs, the costation in neither case being dependent purely on size. In the ephelic stage the Spring Creek shell has a characteristic humped appearance due to steepening of the umbono-ventral profile towards the latter margin, but this is lost again during geronticism. In *V. gracilicostata* the posterior region of the shell is more depressed and the denticulae of the internal margin are rounded and not pointed, as in the present species.

Although topotypes of these two species may readily be separated, there occur in the Dennant Coll., Nat. Mus., shells labelled C. Otway, Br. Ck. and Picnic B. (probably Brown's Creek, on the Aire Coast, and Picnic Point on the Aire River), bearing 34, 31 and 30 ribs respectively. While the three shells exhibit minor differences, yet they combine the general shape of the Spring Creek shell with a less degree of costation, and may be regarded as annectant forms between *V. gracilicostata*, the Table Cape representative, and *V. janjukiensis*, the Spring Creek equivalent. In the absence of a continuous series linking the two forms at the one locality, as obtained in the case of *scabrosa* and *polynema*, we prefer to keep *gracilicostata* and *janjukiensis* at present as distinct species.

Occurrence.—Janjukian (Miocene).—Common at Spring Creek (Bird Rock Cliffs), Torquay, Victoria. Holotype coll. and pres. to Nat. Mus., Melb., by F. A. Singleton.

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Mr. F. A. Cudmore has kindly lent and subsequently presented to the National Museum a specimen of *Propeamusium atkinsoni* from the type locality of Table Cape.

Our best thanks are also due to Mr. C. J. Gabriel for giving us on many occasions his valued aid in regard to recent allied species and for the loan of material from his collection.

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EXPLANATION OF PLATES.

(Numbers in brackets refer to registered specimens in the National Museum, Melbourne.)

PLATE X.

All figures 1·8 times natural size.

- Fig. 1.—*Nucula brevitergum*, sp. nov. Balcombian (Oligocene). Muddy Creek, lower beds, Vic. Holotype, left valve. Dennant Coll., Nat. Mus., Melb. (*a*) exterior; (*b*) interior. [13461]
- Figs. 2-4. *Sarepta obolella* (Tate). Balcombian. Muddy Creek, lower beds, Vic. Plesiotypes, adult left and juvenile right valves. Dennant Coll., Nat. Mus. [13462-4]
- Fig. 5.—*S. obolella* (Tate) (= *S. tellinaeformis* Hedley). Recent. Botany Heads (33-56 faths.), N.S.W. Plesio-type, right valve. Reg. No. 48115 in Aust. Mus., Sydney. (*a*) exterior; (*b*) interior.
- Fig. 6.—*S. obolella* (Tate). Balcombian. Muddy Creek, lower beds, Vic. Plesio-type, right valve. Dennant Coll., Nat. Mus. (*a*) exterior; (*b*) interior. [13465]
- Fig. 7.—*S. obolella* (Tate). Barwonian. Orphanage Hill, Fyansford, Vic. Plesio-type, right valve. G. S. V. Coll. Nat. Mus. (*a*) exterior; (*b*) interior. [13466]
- Figs. 8-12.—*S. planiuscula* (Tate). Janjukian (Miocene). Adelaide Bore, S.A. Syntypes. Tate Coll., Adelaide University.
- Fig. 13.—*Propcamusium atkinsoni* (Johnston). Janjukian. Table Cape, lower beds, Tas. Plesio-type, right valve, exterior. Nat. Mus. Coll., pres. F. A. Cudmore. [13467]

Figs. 14-19.—*P. atkinsoni* (Johnston). Balcombian. Muddy Creek, lower beds, Vic. Plesiotypes. Fig. 14, right exterior [13468]; Fig. 15, right interior [13469]; Fig. 16, left exterior, [13470]; Fig. 17, right exterior [13471]; Fig. 18, left interior [13472]; Fig. 19, left exterior, unusually large specimen [13473]. Dennant Coll., Nat. Mus.

PLATE XI.

All figures natural size.

- Figs. 20, 21.—*Venericardia gracilicostata* (T. Woods). Janjukian. Table Cape, Tas. Plesiotypes, right valves. Tate Coll. (coll. R. M. Johnston), Adel. Univ.
- Fig. 22.—*V. latissima* (Tate). Janjukian. Adelaide Bore, S.A. Holotype, left valve. Tate Coll., Adel. Univ.
- Fig. 23.—*V. latissima* (Tate). Adelaide Bore, S.A. Metatype, left valve. Tate Coll., Adel. Univ.
- Fig. 24.—*V. scabrosa* (Tate). Janjukian. R. Murray Cliffs, S.A. Lectotype, right valve. Tate Coll., Adel. Univ.
- Fig. 25.—*V. scabrosa* (Tate). Balcombian. Muddy Creek, lower beds, Vic. Ideotype, right valve. Tate Coll., Adel. Univ.
- Fig. 26.—*V. scabrosa* (Tate). Balcombian. Balcombe Bay, Vic. Plesiotype, left valve (from Tate's tablet of *polynema*). Tate Coll., Adel. Univ.
- Fig. 27.—*V. scabrosa*, var. *polynema* (Tate). Balcombian. Balcombe Bay, Vic. Holotype, left valve. Tate Coll., Adel. Univ.
- Fig. 28.—*V. scabrosa*, var. *polynema* (Tate). Balcombian. Balcombe Bay, Vic. Metatype, right valve. Tate Coll., Adel. Univ.
- Fig. 29.—*V. scabrosa*, var. *polynema* (Tate). Balcombian. Balcombe Bay, Vic. Plesiotype, left valve (from Tate's tablet of *scabrosa*). Tate Coll., Adel. Univ.
- Fig. 30.—*V. janjukiensis*, sp. nov. Janjukian. Bird Rock Cliffs, Torquay, Vic. Holotype, right valve. Nat. Mus.; coll. and pres. F. A. Singleton. (*a*) exterior; (*b*) interior. [13474]
- Fig. 31.—*V. janjukiensis*, sp. nov. Janjukian. Bird Rock Cliffs, Torquay, Vic. Paratype, right valve (from Tate's tablet labelled *polynema*). Tate Coll., Adel. Univ.